High Energy Physics - Theory

Relating the Archetypes of Logarithmic Conformal Field Theory

Thomas Creutzig, David Ridout

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Logarithmic conformal field theory is a rich and vibrant area of modern mathematical physics with well-known applications to both condensed matter theory and string theory. Our limited understanding of these theories is based upon detailed studies of various examples that one may regard as archetypal. These include the c=-2 triplet model, the Wess-Zumino-Witten model on SL(2;R) at level k=-1/2, and its supergroup analogue on GL(1|1). Here, the latter model is studied algebraically through representation theory, fusion and modular invariance, facilitating a subsequent investigation of its cosets and extended algebras. The results show that the archetypes of logarithmic conformal field theory are in fact all very closely related, as are many other examples including, in particular, the SL(2|1) models at levels 1 and -1/2. The conclusion is then that the archetypal examples of logarithmic conformal field theory are practically all the same, so we should not expect that their features are in any way generic. Further archetypal examples must be sought.

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